

Claims: -

1. A method for the manufacture of patterned microparticles, comprising immobilising microparticles to be patterned on a surface of a porous membrane, causing a coating material which can bind to exposed  
5 surfaces of said microparticles, and which can permeate through the pores of said membrane, to flow relative to said immobilised microparticles, and removing the microparticles from the membrane following binding of said coating material.
2. A method according to Claim 1, wherein the microparticles  
10 are nanoparticles.
3. A method according to Claim 2, wherein the immobilised nanoparticles are nanospheres.
4. A method according to any one of Claims 1-3, wherein the microparticles are composed of silica or latex.
- 15 5. A method according to any preceding claim, wherein the surface of the microparticles is chemically modified to facilitate binding of the coating material thereto.
6. A method according to any preceding claim, wherein the coating material is composed of nanoparticles.
- 20 7. A method according to Claim 6, wherein the nanoparticles are inorganic nanoparticles.

8. A method according to Claim 7, wherein the nanoparticles are gold nanoparticles.

9. A method according to Claim 8, wherein the gold nanoparticles are citrate-stabilised gold nanoparticles.

5 10. A method according to any one of Claims 1-6, wherein the coating material is comprised of nanoparticles of an organic material.

11. A method according to Claim 10, wherein the coating material is comprised of nanoparticles of a biomolecular material.

10 12. A method according to any preceding claim, wherein the membrane is a high porosity alumina membrane with the pores arranged in a hexagonal array.

13. A method according to any preceding claim, wherein the microparticles to be patterned are spin-coated onto the membrane surface.

15 14. A method according to any preceding claim, wherein the coating material comes into contact with the immobilised microparticles prior to filtration and excess coating material passes through the pores of the membrane.

20 15. A method according to Claim 14, wherein a differential pressure is applied to the membrane during said flow of the coating material relative to the immobilised microparticles.

16. A method according to Claim 14 or 15, wherein a flow rate greater than  $1.5\text{cm}^3/\text{min}$  is used during filtration of the coating material through said membrane.

17. A method according to any one of Claims 1-13, wherein the  
5 coating material comes into contact with the immobilised microparticles following passage through the pores of the membrane.

18. A method according to Claim 17, wherein the flow of coating material through the membrane is by means of gravity.

19. A method according to Claim 17, wherein the flow of  
10 coating material through the membrane is by means of an electric field.

20. A method according to Claim 17, wherein the flow of coating material through the membrane is by means of a magnetic field.

21. A method according to any one of Claims 17-20, wherein the mean diameter of the immobilised microparticles exceeds the  
15 membrane pore diameter so as to restrict the number of pores in direct contact therewith.

22. A method according to any preceding claim, wherein the coated immobilised microparticles are contacted with a solution of a bi-functional molecule which can bind to said coating material so that a  
20 number of layers of coating material can be built up on the immobilised microparticles retained on said membrane.

23. A method according to any preceding claim, wherein the coated microparticles are removed from the membrane by sonication.

24. A method according to any one of Claims 1-22, wherein the coated microparticles are removed from the membrane by dissolution of  
5 the membrane.

25. An anisotropically, biologically modified patterned microparticle.

26. An anisotropically, biologically modified patterned nanoparticle.

10 27. An anisotropically, biologically modified patterned nanosphere.

28. A nanostructure assembled on an anisotropically, biologically modified patterned particle according to any one of Claims 25 - 27.

15 29. A nanostructure according to Claim 28, wherein the nanostructure is a nanowire.

30. A method according to Claim 1, substantially as hereinbefore described and exemplified.

20 31. An anisotropically, biologically modified patterned microparticle according to Claim 25, substantially as hereinbefore described and exemplified.

32. A nanostructure according to Claim 29, substantially as hereinbefore described and exemplified.

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